

Lifting Bodies: A NASA Perspective

Robert G. Hoey's study, "Testing Lifting Bodies at Edwards," provides a valuable history of the lifting body program conducted jointly by the NASA Flight Research Center (now NASA's Hugh L. Dryden Flight Research Center) and the Air Force Flight Test Center at Edwards Air Force Base, California. It does so, however, from the perspective of an Air Force civil servant who worked on both the Dyna-Soar and the lifting body programs.

While this perspective is not blatant or entirely one-sided, it comes through significantly in Chapter 2, which is devoted exclusively to the X-20 Dyna-Soar and which might lead an unsuspecting reader to infer a greater influence of the X-20 on the lifting body program than Hoey specifically implies. In Chapter 2, Hoey states explicitly that Dyna-Soar "was NOT a lifting body," but a winged glider designed to test lifting reentry. Despite this disclaimer and Hoey's careful and very limited claims for Dyna-Soar's contributions to the lifting body program, the fact that there is an entire chapter devoted to a non-lifting body that never flew in a study that devotes a single chapter to the M2-F2 *and* the M2-F3 and one each to the other lifting bodies, all of which did fly, gives undue prominence to Dyna-Soar. Hoey's study, after all, is explicitly about lifting bodies and not about lifting reentry and other programs to which the X-20 made significant contributions.

From a NASA perspective, at least, the lifting body program had its beginnings--as Hoey briefly relates--in the studies of H. J. "Harvey" Allen, Alfred J. Eggers and others at the National Advisory Committee for Aeronautics' Ames Aeronautical Laboratory in the early to mid-1950s into the blunt body reentry principle and the concept of lifting reentry from space. This predated Dyna-Soar. And it was these studies, plus roughly contemporary ones at the NACA Langley Aeronautical Laboratory on wingless lifting shapes, that led R. Dale Reed, a young engineer at the Flight Research Center, to advocate a flight research program involving lifting bodies. In turn, it was Reed's efforts, seconded by research pilot Milton O. Thompson and supported by FRC Director Paul Bikle, that really inaugurated the lifting body flight research program.

In the course of time, as Hoey relates, Langley's studies led to the HL-10, one of the lifting body configurations. Later studies by the Martin Company under contract to the Air Force resulted in the SV-5 configuration that became the X-24A, later modified to the X-24B--two other lifting body configurations flown at Edwards.

In view of these developments and the chronology discussed above, it is misleading from the NASA perspective to devote an entire second chapter in a study of lifting bodies to the Dyna-Soar, even though it did make contributions to lifting bodies *in* the development of the Pulse Code Modulation data system used in the lifting body program. This is not to denigrate Dyna-Soar's overall contributions to lifting reentry technology. Even though the X-20 never flew, the research and wind-tunnel testing for the program contributed significantly to many hypersonic and reentry programs, especially the Space Shuttle.

The point of this brief essay is rather one of focus. The intent here is not to disagree with Hoey's facts but simply to present a different perspective on what was and was not critical in the development of the lifting body program. The reader can then make a more informed decision as to which perspective is more valid. This issue aside, the Hoey study is a valuable contribution to an important story. For that reason, it is made available on the NASA Dryden website.

Reference: For further reading, consult *From Max Valier to Project Prime*, vol. 1 of *The Hypersonic Revolution*, edited by Richard P. Hallion (Wright-Patterson Air Force Base, Ohio: Aeronautical Systems Division, 1987), esp. Clarence J. Geiger, "Strangled Infant: The Boeing X-20A Dyna-Soar," pp. 185-377, and John V. Becker, "The Development of Winged Reentry Vehicles: An Essay from the NACA-NASA Perspective, 1952-1963," 379-447.